

### ABSTRACT OF THE DISCLOSURE

A method for manufacturing a semiconductor device wherein phenomenon called the skirting and dispersion in reliability of a TFT among lots can be reduced is provided by using a method for cleaning a plasma etching apparatus, a method for plasma etching, and a method for manufacturing a semiconductor device using the plasma etching method. Concretely, the plasma density may be kept constant by exciting plasma using a gas capable of etching quartz, for example,  $\text{Cl}_2$ , or a mixed gas of  $\text{Cl}_2$  with a fluorine-based gas such as  $\text{CF}_4$  after using an etching gas such as  $\text{BCl}_3$  with which  $\text{BO}_x$  adheres to the quartz surface and thus removing the  $\text{BO}_x$  adhering to the quartz surface inside the chamber (that is, cleaning is performed).

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